ABSTRACT

The invention provides methods of protecting solid-state proteins from the effects of ionizing radiation which comprise combining the protein with a radiation-protecting amount of a methoxysalicylaldehyde derivative, preferably 3-methoxysalicylaldehyde; radiation-protecting amounts of a methoxysalicylaldehyde derivative, preferably 3-methoxysalicylaldehyde, and 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid; or radiation-protecting amounts of a methoxysalicylaldehyde derivative, preferably 3-methoxysalicylaldehyde and isopropanol, prior to exposing the protein to ionizing radiation.

The invention further provides radiation-resistant pharmaceutical formulations comprising a protein and a methoxysalicylaldehyde derivative, preferably 3-methoxysalicylaldehyde; a protein and a combination of a methoxysalicylaldehyde derivative, preferably 3-methoxysalicylaldehyde, and 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid; or a protein and a combination of a methoxysalicylaldehyde derivative, preferably 3-methoxysalicylaldehyde and isopropanol.

The invention still further provides a composition comprising a combination of a methoxysalicylaldehyde derivative, preferably 3-methoxysalicylaldehyde, and 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid, and for the use of such composition in pharmaceutical formulations as a radioprotectant.